

Marine migration routes of North-western European silver eel (*Anguilla anguilla* L.)

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Scope

The marine spawning migration of the European eel (*Anguilla anguilla* L.) is one of the most challenging biological questions to date. Despite extensive research on the complex life cycle of this critically endangered species, many questions still remain. One of these knowledge gaps is the eel migration route from the European coastline to their spawning ground in the Sargasso Sea. Experts generally agree on the British Isles hypothesis: eels from North-Western Europe are assumed to use the residual current and migrate north in the North Sea and pass north of the British Isles to reach the Atlantic Ocean, where they take a southwest-to-westward course to their spawning grounds. This hypothesis is based on findings of a few eels from the German Bight and the Baltic Sea. The aim of this study was to validate the British Isles hypothesis by acoustic tracking of European silver eel from North-Western Europe. We found striking evidence that eel from some parts of north-western Europe migrate in a counter-current direction through the English Channel to reach the spawning grounds. These results not only will provide more insight into the general migration behaviour of North-Western European eel, but can also contribute to more efficient global conservation of the species.

Acoustic telemetry

26 eels were tagged in Belgium and 40 in the Netherlands with an acoustic transmitter (VEMCO telemetry system, V13-1L, approx. battery life of 3 years) and tracked between January 2014 and February 2015 by a receiver network that is partly funded by the LifeWatch project. This network consisted of 51 receivers that were positioned on shipping buoys (VLOOT and Rijkswaterstaat NL) in the Belgian part of the North Sea and the Scheldt estuary and 89 receivers in freshwater habitats.



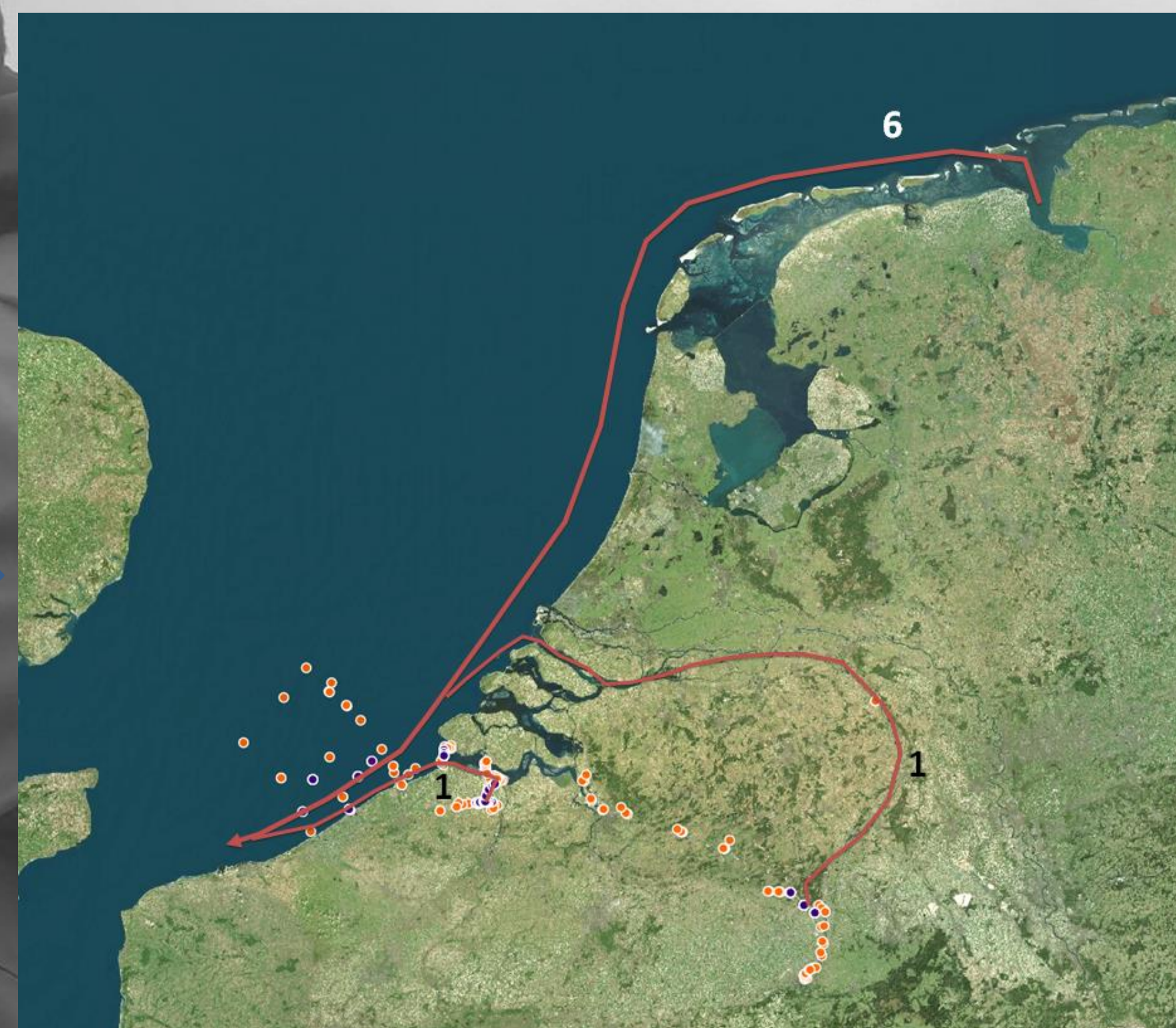
Results

8 eels were detected by the receiver network within 20km off the Belgian Coast and at the mouth of the Scheldt Estuary:

- 6 from Delfzijl, the Netherlands
- 2 from Belgium
 - 1 originating from a polder system
 - 1 originating from the Albert Channel



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Conclusion

These observations provide new insights in the marine migratory phase of European silver eel in the southern North Sea. Further research should demonstrate which cues drive eel to take the counter-current oriented route through the English Channel. This route could result in a different bio-energy management and a different migration timing or arrival at the spawning grounds. Therefore, eels from the southern North Sea might have a different contribution to the spawning population. Also, the effect of anthropogenic activities in the southern North Sea could have important impacts on the migratory behaviour of European silver eels. So far, it is still unknown if European eel from North-Western Europe contribute considerably to the European eel spawning population and if management applications of Western Europe have a substantial impact on the recovery of the population.